ACCIDENT RECONSTRUCTION SYSTEM

Eaton VORAD Technologies, L.L.C.
10802 Willow Court
San Diego, California 92127

and

VORAD Safety System, Inc.
10802 Willow Court
San Diego, California 92127

Accident Reconstruction System

CONTENTS

ACCIDENT RECONSTRUCTION

SYSTEM DESCRIPTION

The Eaton VORAD model EVT-300 Collision Warning System (CWS) may be equipped with a data recording capability that can be used for reconstructing vehicle activity and radar detection activity for the period of time immediately preceding an accident or other incident of interest.

This data is written in a continuous loop method in the CPU that can be removed after an accident or incident of interest and sent to Eaton VORAD Technologies, San Diego, California, for data transcription and the preparation of tabular, graphical and narrative reports regarding the contents of the CPU. There are various report levels and types that can be ordered by the customer. In addition, Eaton VORAD can provide expert witness services for the customer if required to interpret or clarify the radar data and/or reports.

The memory size in the CPU is sufficient to store various identification/header data plus continuous loop data for two accident/incident periods. Each accident/incident period is typically 10 to 12 minutes long. The actual length of time depends on the traffic or radar target detection activity present during the period. The length of recording time decreases as radar activity increases. Data is being recorded in an endless loop method in the CPU whenever the speedometer indicates a vehicle speed greater than zero. Speed is used as the data recording start/stop indicator rather than electrical power because power may remain on for some time following an accident, whereas, the speed will go to zero after an accident.

The CPU is capable of storing two separate accident/incident event periods. This is designed to provide for the possibility that the radar equipped vehicle is going to continue driving after an accident/incident, but it is desired to "freeze" the data in the CPU for that accident/incident. The data can be frozen by pressing in on the right hand control knob on the driver display unit (DDU) for five seconds until a tone is detected. When the data freeze action is detected, the data recording system locks in the contents of the recently passed time period, and then starts writing to a new RAM area in the CPU. The second accident/incident period cannot be frozen and will always contain data for the most recent time period of vehicle and radar activity. If a driver freezes an accident/incident time period, it is incumbent upon that driver to advise the supervisor at the end of the vehicle trip/run of the freeze action and describe the accident/incident that lead to that action. The CPU in the vehicle should be removed and sent to Eaton VORAD Technologies for transcription if determined necessary by the customer. Typically, the driver would be required to initiate an accident report or police report following such an accident/incident. A new CPU should be inserted in the vehicle for future data recording if the vehicle is to remain in service.

The data in the CPU also shows real clock time and the date of the accident/incident. This information comes from the internal computer for the CWS radar system, which has a battery backed real time clock and date generator. This clock is initially set to the local time of the customer at the time the radar system is installed on the vehicle. The clock and date setting should be periodically checked by the customer during scheduled maintenance.

The data contained in the CPU and any reports prepared from that data are the property of the customer. The customer is responsible for the disposition and custody of the CPU and all data reports. Any outside request for the data or the CPU itself must be addressed to the customer. **Eaton VORAD Technologies** will not release any data or the CPU to anyone other than the customer. Typically a customer representative or employee removes the CPU from a vehicle involved in an accident and takes action regarding the CPU as deemed appropriate. If local, state or federal authorities come into possession of the CPU and request data transcriptions or reports from Eaton VORAD Technologies; the customer will be immediately contacted and asked to advise Eaton VORAD Technologies of their desired action. The authorities will be advised to contact the customer regarding the data on the CPU and/or any possible reports to be generated from the data.

CPU HANDLING PROCEDURES

Customer CPU Handling Procedures

The removable Central Processing Unit (CPU) is located in the passenger compartment of the vehicle. A CPU should always be present while the vehicle is in operation. The CPU is removed after an accident or incident of interest and may be sent to Eaton VORAD Technologies for data transcription and report generation services. A new CPU will be sent back to the customer to replace the CPU that is removed for transcription after accidents. This will permit the vehicle to resume operation while the previously installed CPU is in use for accident reconstruction purposes.

It is important that the customer follow a documented procedure with regard to removing the CPU and sending it out for transcription action. The possibility of litigation or the need to produce evidence following an accident is always present, so it is critical that the entire CPU removal and handling process be documented and traceable. It may be required to show in a court or at a deposition exactly who, when and how the CPU was removed, in whose custody the CPU was at all times from the time of removal from the vehicle, how the security of the CPU was protected, and how and when the CPU was sent to **Eaton VORAD Technologies** for transcription.

Typically, a customer representative removes the CPU from the vehicle and delivers it to the proper customer manager. The CPU may be removed by the mechanic, a supervisor, the safety director, or some other management representative of the customer. The data on the CPU is the property of the customer. If a local, state or federal authority at the site of an accident demands the CPU, it may have to be surrendered to that authority. The CPU will not be of use to the authorities since the CPU can only be transcribed by Eaton VORAD Technologies at the request of the customer. If a CPU taken by the authorities is sent to Eaton VORAD Technologies for transcription, the customer will be notified immediately by Eaton VORAD Technologies and asked for directions with regard to the data transcription and the generation of reports. The authority that sent in the CPU will be notified of this action and advised that the customer must be contacted for any action regarding the data contained in the CPU. The authorities will not normally request the CPU and it is not recommended that the CPU be volunteered to them at the site since it is not usable unless it is transcribed by Eaton VORAD Technologies and the authorities may not know how to safely handle the CPU.

The Property Control Form shown as Appendix A is a sample of the type form that can be used to trace custody and accountability of the CPU by the customer from the time it is removed from the vehicle until it is sent to Eaton VORAD Technologies for transcription. A copy of this form should accompany the CPU when it is sent to Eaton VORAD Technologies to provide the basic information regarding the incident or accident.

Eaton VORAD Technologies will provide a basic quantity of Property Control Forms, plastic bags to protect the CPU, boxes for mailing, and mailing address labels for sending the CPU to Eaton VORAD Technologies. It is recommended that the customer use a delivery service that provides a signature receipt for proof of delivery. This could be certified mail, Federal Express or etc.

The CPU and the Customer Property Control Form should be sent to:

Eaton VORAD Technologies, L.L.C.
10802 Willow Court
San Diego, CA 92127

Telephone: (619) 676-5501

Attention: Accident Investigation Representative

CENTRAL PROCESSING UNIT HANDLING PROCEDURES

Eaton VORAD Technologies CPU Handling Procedures

Upon arrival of the CPU from a customer for data transcription, the VORAD receptionist or mail clerk will find one of the designated Accident Investigation Representatives (AIR) to sign for the CPU from the carrier and assume custody of the CPU. If a designated AIR cannot be located, the receptionist or mail clerk will sign for the CPU and secure it in a designated locked container until an AIR can be found to take custody.

After receipt of the CPU at VORAD, the following action steps will be taken and documented:

1. The AIR will initiate the VORAD internal custody control form that tracks and stays with the CPU for as long as it remains at VORAD. The general incident description data and the customer identification data will be entered at the top of the form. The CPU is to be kept under lock and key at all times when it is not in the physical possession of an authorized representative.

2. The CPU will be marked by attaching an adhesive sticker with a unique VORAD ID number and other appropriate data to ensure positive identification in the future.

3. The AIR will take the CPU to an authorized software engineer for data downloading. The data downloading will be performed in the presence of the AIR who will resume custody of the CPU after downloading. The CPU data will be downloaded to a hard disk file on the designated computer for subsequent use in report preparation. Two floppy disk copies of the data file will be made at this time. The floppy disks will be marked with the unique and appropriate identifying data. Floppy disk number 1 will be kept with the original CPU in the designated locked container. Floppy disk number 2 will be retained by the software engineer as a back-up copy of their hard disk data file. If and when the original CPU is returned to the customer, the floppy disk number 1 with the original data will be retained at VORAD for future reference. It is important that VORAD be able to show at any time in the future that the data reflected in the reports are the same data that was contained on the original CPU received from the customer.

4. The authorized software engineer will prepare a printout of the header information on the CPU and deliver the printout to the AIR.

5. The AIR will review the header data with the software engineer and determine if it is intact and readable and if it pertains to the incident of interest.

6. The AIR will then contact the appropriate customer representative (normally by telephone) and discuss the header data. At this point, the customer representative will be asked what action is desired of Eaton VORAD Technologies. There are two levels of reports that can be ordered by the customer. The report options are as follows:

Basic Data Report: This report provides basic tabular and graphical data sheets of the CPU radar and vehicle data for the event of interest. There is no data interpretation or narrative provided. This data report can normally be provided within two weeks of receiving the CPU.

Full Data Report: This is a complete report that includes all tabular data, graphical data plus an engineering evaluation of the data with a complete narrative to walk the reader through the sequence of data activity and discuss the time relationships of the radar data to the vehicle data. In addition, an analysis of the vehicle segment data is provided from the data sorted in the Electronics Assembly if that data is available. This report can normally be provided within 4 weeks of receipt of the CPU.

7. If the data reports are required in a shorter time than the normal processing, VORAD will work with the customer to expedite the service.

8. The selected data report will be sent to the customer by Federal Express as soon as completed. Telephone conversations between VORAD and the customer may take place during the report preparation period.

9. The original CPU will be returned to the customer at his/her request for final disposition and/or storage.

10. All data contained in the CPU and shown in the reports are the property of the customer and will be treated with complete privacy by Eaton VORAD Technologies.

11. Expert witness service can be provided by a qualified engineer from Eaton VORAD Technologies on a reimbursable basis if required by the customer.

ACCIDENT RECONSTRUCTION

REPORTS, SERVICES, and FEES

There are several levels of accident reconstruction services offered by Eaton VORAD Technologies, L.L.C. These services and the associated typical fees are as shown below:

A. Initial report. Receive, handle and protect data Central Processing Unit, print out the header data, analyze header data for data integrity and applicability to incident of interest and provide initial header data report by telephone to the customer.

Estimated fee/charge: $ 150.00

B. Basic Data Report. Provide report of basic tabular and graphical data sheets of the radar and vehicle data as reconstructed and plotted from the CPU contents for the incident of interest. This report includes no data interpretation or narrative. Report normally provided within two weeks of receipt of the CPU.

Estimated fee/charge: $750.00

C. Full Data Report. This is a complete report that includes all tabular data, graphical data plus an engineering evaluation of the data with a complete narrative to walk the reader through the sequence of data activity and discuss the time relationships of the radar data to the vehicle data. This report can normally be provided within 4 weeks of receipt of the CPU.

Estimated fee/charge: $1450.00

D. Expert witness service. Expert witness service of a qualified radar engineer can be provided if required by the customer for depositions or court appearances. The expert witness service is confined to technical interpretation of the radar and vehicle data contained in the reports.

Estimated fee/charge: $1000.00 per day plus expenses.

CPU DATA FORMAT

Data Size: 32 Kbytes by 8 bits, typical. Can be larger as an option.

Features: CPUs can be read with PC adapter assembly.
Standby battery backed power from a built-in 10 year Lithium battery.
Has built-in 5-pin long-life connector.
CPU inserted into slot in Electronics Assembly.

CPU DATA FIELDS ARE SHOWN BELOW:

Data Fields: Header Information
Vehicle Data Record Info is updated on the CPU from the internal memory once per second.

Vehicle Data Record Start Flag: *(Used internally to indicate segment empty or used)*
Vehicle Data Record Driver ID: *(Segment field data from internal memory if used)*
Vehicle Data Record Driver Name: *(Segment field data from internal memory if used)*
Vehicle Data Record Date & Time: *(Segment field data from internal memory)*
Vehicle Data Record Start Date & Time: *(Segment field data from internal memory)*
Vehicle Data Record Spare 0: *(Not used)*
Vehicle Data Record Elapse Time: *(Segment field data from internal memory)*
Vehicle Data Record Distance: *(Segment field data from internal memory)*
Vehicle Data Record Max. Speed: *(Segment field data from internal memory)*
Vehicle Data Record Max. Speed Date & Time: *(Segment field data from internal memory)*
Vehicle Data Record Braking Distance: *(Segment field data from internal memory)*
Vehicle Data Record Time Over 65 mph: *(Segment field data from internal memory)*
Vehicle Data Record Time between 55 & 65 mph: *(Segment field data from internal memory)*
Vehicle Data Record Time between 45 & 55 mph: *(Segment field data from internal memory)*
Vehicle Data Record Time between 35 & 45 mph: *(Segment field data from internal memory)*
Vehicle Data Record Following Distance: *(Recorded for each of five following time intervals)*
Vehicle Data Record Cut-in: *(Recorded for each of five following time intervals)*
Vehicle Data Record Missing CPU Count: *(Number of times that driver CPU was removed)*
Vehicle Data Record Spare 1: *(Not used)*
Vehicle Data Record Time Missing: *(Total time of vehicle operation with CPU missing)*
Vehicle Data Record Alarm counts: *(Count recorded for all eight types of alarms)*
Vehicle Data Record Expiration Date: *(CPU expiration date written on CPU by customer)*
Vehicle Data Record Event Count: *(Segment field data from internal memory)*
Vehicle Data Record CRC: *(Cycle Redundancy Check code for data accuracy)*

Driver Event Record info is written to the driver CPU at power up or CPU insertion *for each event*.
Driver Event Record Version: *(Software version currently installed in the electronics assembly)*

Driver Event Record Vehicle ID: *(Vehicle ID no. loaded into electronic assembly at installation)*
Driver Event Record Pulses-per-mile: *(Speedometer calibration number for different size tires)*
Driver Event Record Speed Code: *(Code use internally for speed calculation from pulse count)*
Driver Event Record Radar Serial No: *(Radar serial no. loaded in internal memory at factory)*
Driver Event Record Date & Time: *(Date and clock time that CPU was inserted in system)*
Driver Event Record Driver ID: *(Driver ID number written on CPU by customer when issued)*
Driver Event Record Driver Name: *(Driver name written on CPU by customer when issued)*
Driver Event Record Expiration Date: *(CPU expiration date written on CPU by customer)*
Driver Event Record Driver Ready For Work: *(Not implemented yet - always "Ready")*
Driver Event Record Event Count: *(Shows the number of events frozen by driver, i.e. 0, 1, or 2)*
Driver Event Record Speed Limit (mph): *(Max speed allowed written on CPU by customer)*
Driver Event Record Driver Fitness Test Date: *(Not implemented yet - always blank)*
Driver Event Record Driver Fitness Test Location: *(Not implemented yet - always blank)*
Driver Event Record Driver CPU ID: *(CPU ID number assigned by customer)*

Event Control Record info is updated as necessary to track memory storage locations *for each event*.

Event Control Record Save Date & Time:
Event Control Record Save Pointer:
Event Control Record Save Count:
Event Control Record Save Start Flag:
Event Control Record Date & Time:
Event Control Record Pointer:
Event Control Record Count:
Event Control Record End Flag:
Number of Records Actually Stored:

Data Fields: Radar and Vehicle Data for Each Event

Vehicle Data is updated 4 times per second.

Vehicle Speed: *(Speed of vehicle with radar in mph)*
Vehicle Brake: *(Shows brake light "ON" or "OFF")*
Vehicle Turn Rate: *(Shows steering position or: (Shows Turn Rate n 0, 1R, 2R, 1L, or 2L. 0 = straight ahead)*
Right Turn Signal: *(Shows if right turn signal is "ON" or "OFF")*
Left Turn Signal: *(Shows if left turn signal is "ON" or "OFF") (Only if left sensor installed)*
Right Side Sensor: *(Shows if vehicle detected on right side with "OFF" or "RIGHT")*
Left Side Sensor: *(Shows if vehicle detected on left side with "OFF" or "LEFT")(If installed)*
Volume Level: *(Shows volume level from 0 to 15 with 0 the lowest setting, but still audible)*
Advance Warning Level: *(Advanced warning. Fixed at maximum sensitivity for some customers)*
Alarm/Tone Level: *(Shows type of alarm given by radar system, 0 through 8 per description)*

Radar Data on Objects/Targets is updated whenever it changes up to max of 30 times per second.

Object 1 Speed: *(Shows radar object number 1 speed in mph)*
Object 1 Range: *(Shows distance from vehicle to object 1 in feet)*
Object 1 Cross Range: *(Shows object number 1 lateral position w/ regards to vehicle in feet)*
Object 2 Speed: *(Shows radar object number 2 speed in mph)*
Object 2 Range: *(Shows distance from vehicle to object 2 in feet)*
Object 2 Cross Range: *(Shows object number 2 lateral position w/ regards to vehicle in feet)*
Object 3 Speed: *(Shows radar object number 3 speed in mph)*
Object 3 Range: *(Shows distance from vehicle to object 3 in feet)*
Object 3 Cross Range: *(Shows object number 3 lateral position w/ regards to vehicle in feet)*

Radar Data on Objects/Targets is updated whenever it changes up to max of 30 times per second.

Recorded Time: *(Clock time is recorded each time any data changes occur up to a max of 30 times per second. Time is stored in the format "HH:MM:SS.ss"where "HH"' is the hour of the day - 24 hour day,"MM" is the minute, "SS" is the second and "ss" is hundredths of a second. Time is shown as central standard time.)*

Data Space and Time available in the CPUs:

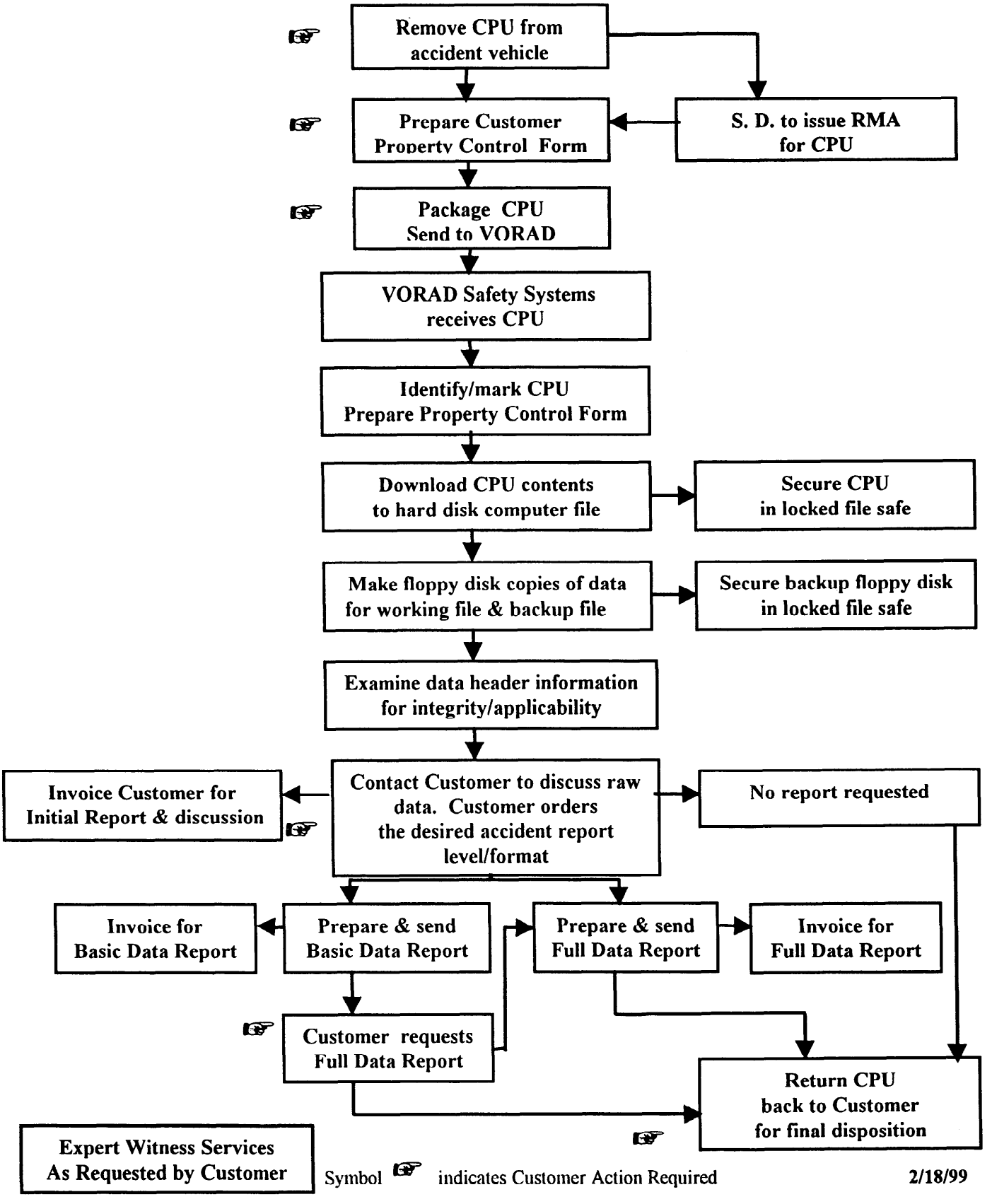
1) There are two data writing scratch pad areas available in the CPU to store data on two different events. The amount of time that can be stored on each event varies according to the amount of radar target activity. If the traffic is very low and there is little radar target activity, then each event data space may last as long as 30 minutes or so, and if the traffic is busy and target activity is high, then the data space may span a period of only 10 minutes or so.

2) Event Data is continuously written to the scratch pad area until the area is filled and then new data is written over the oldest data in a continuous loop fashion. Data continues to write to the CPU whenever the vehicle is moving, i.e., the vehicle speed is greater than 0 mph. Data actually continues to write to the CPU for 1 minute past the vehicle speed going to 0 mph to ensure that everything is recorded. Any time that the CPU is removed it will contain 10 to 30 minutes of the most recent vehicle and radar data, which can be used to reconstruct vehicle motion and radar target activity leading up to some incident of interest.

3) If a driver wants to freeze recorded data for some event or incident for later review, but continue driving the vehicle, the driver can push and hold the right knob for 5 seconds or longer on the Driver Display Unit (DDU) and data on the first scratch pad area will be frozen or saved. At this point, the radar system will then start recording data on the second scratch pad area of the CPU just as described above for the first scratch pad area. The second scratch pad area cannot be frozen. It will always contain vehicle and radar data covering the most recent period of vehicle operation. If the driver does freeze the first scratch pad data area; he/she should tell their supervisor for CPU removal and data translation.

4) The data stored in these areas can be used to produce graphical, tabular and narrative reports for the time periods covered.

Eaton VORAD Accident Reconstruction Procedure



Symbol ☞ indicates Customer Action Required

2/18/99

ACCIDENT RECONSTRUCTION REPORT

SAMPLE DATA SHEETS

This section provides sample data sheets to show the types of data that can be reconstructed from the CPU. The Basic Data Report provides only the data sheets generated from the data in the CPU. The Full Data Report includes all the data sheets plus an engineering analysis and narrative of the internal memory of the vehicle Central Process

A. SAMPLE CPU HEADER DATA

B. SAMPLE TABULAR DATA SHEET

C. SAMPLE GRAPHICAL DATA SHEET

Vehicle Data Record

Card Type	:	A/R EVT300
Driver ID	:	12345
End Date	:	11-JAN-1999 15:46
Record Revision	:	6
Vehicle ID	:	1712
CPU Serial Number	:	1020
FE Serial Number	:	7233
CPU S/W Version	:	40736-103
FE S/W Version	:	40899-103
Checksum Verified	:	Yes

Event Control Record

Number Of Records	:	6550

									OBJECTS								
									1			2			3		
TIME	*TONE ALRT	HD-WY	VL	STR	SIG	SID SNS	VEH BRK	SPD MPH	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT
15:46:00.05	0	15	4	3			OFF	65									
15:46:00.32	0	15	4	4			OFF	65									
15:46:00.58	0	15	4	2			OFF	65									
15:46:00.84	0	15	4	0			OFF	65									
15:46:01.10	0	15	4	2			OFF	65									
15:46:01.37	0	15	4	1			OFF	65									
15:46:01.82	0	15	4	2			OFF	65									
15:46:02.02	0	15	4	1			OFF	65									
15:46:02.28	0	15	4	2			OFF	65									
15:46:02.54	0	15	4	1			OFF	65									
15:46:02.81	0	15	4	0			OFF	65									
15:46:03.07	0	15	4	1			OFF	65									
15:46:03.33	0	15	4	0			OFF	65									
15:46:03.86	0	15	4	2			OFF	65									
15:46:04.12	0	15	4	3			OFF	65									
15:46:04.45	0	15	4	4			OFF	65	63	97	8L						
15:46:04.51	0	15	4	4			OFF	65	63	97	8L						
15:46:04.58	0	15	4	4			OFF	65	63	96	8L						
15:46:04.58	0	15	4	4			OFF	65	63	96	8L						
15:46:04.64	0	15	4	5			OFF	65	63	96	8L						
15:46:04.71	0	15	4	5			OFF	65	63	96	8L						
15:46:04.77	0	15	4	5			OFF	65	63	96	7L						
15:46:04.84	0	15	4	5			OFF	65	62	96	8L						
15:46:04.84	0	15	4	5			OFF	65	62	96	8L						
15:46:04.90	0	15	4	3			OFF	65	62	95	8L						
15:46:04.97	0	15	4	3			OFF	65	62	95	8L						
15:46:05.04	0	15	4	3			OFF	65	62	95	8L						
15:46:05.10	0	15	4	3			OFF	65	62	94	8L						
15:46:05.17	0	15	4	3			OFF	65	62	94	8L						
15:46:05.23	0	15	4	3			OFF	65	62	94	8L						
15:46:05.30	0	15	4	3			OFF	65	61	93	8L						
15:46:05.36	0	15	4	3			OFF	65	61	93	8L						
15:46:05.36	0	15	4	3			OFF	65	61	93	8L						
15:46:05.43	0	15	4	2			OFF	65	61	93	8L						
15:46:05.49	0	15	4	2			OFF	65	61	93	8L						
15:46:05.56	0	15	4	2			OFF	65	61	92	8L						
15:46:05.63	0	15	4	2			OFF	65	61	92	7L						
15:46:05.69	0	15	4	2			OFF	65	61	92	7L						
15:46:05.76	0	15	4	2			OFF	65	61	91	7L						
15:46:05.82	0	15	4	2			OFF	65	61	90	7L						
15:46:05.82	0	15	4	1			OFF	65	61	90	7L						
15:46:05.89	0	15	4	1			OFF	65	61	90	7L						
15:46:05.95	0	15	4	1			OFF	65	61	90	7L						
15:46:06.02	0	15	4	1			OFF	65	61	89	7L						
15:46:06.08	0	15	4	1			OFF	65	61	89	7L						
15:46:06.08	0	15	4	2			OFF	65	61	89	7L						
15:46:06.15	0	15	4	2			OFF	65	60	88	7L						
15:46:06.21	0	15	4	2			OFF	65	60	88	7L						
15:46:06.28	0	15	4	2			OFF	65	60	87	7L						

Driver ID: 12345 Vehicle ID: 1712
Event Date: 11-JAN-1999 Event Number: 1 V04.2B Page 2

									OBJECTS								
									1			2			3		
TIME	*TONE ALRT	HD-WY	VL	STR	SIG	SID SNS	VEH BRK	SPD MPH	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT
15:46:06.35	0	15	4	2			OFF	65	60	87	7L						
15:46:06.35	0	15	4	1			OFF	65	60	87	7L						
15:46:06.41	0	15	4	1			OFF	65	60	87	7L						
15:46:06.48	0	15	4	1			OFF	65	60	86	7L						
15:46:06.54	0	15	4	1			OFF	65	60	86	7L						
15:46:06.61	0	15	4	1			OFF	65	60	85	7L						
15:46:06.67	0	15	4	1			OFF	65	60	85	7L						
15:46:06.74	0	15	4	1			OFF	65	60	84	7L						
15:46:06.74	0	15	4	1			OFF	65	60	84	7L	4	432	1R			
15:46:06.80	0	15	4	1			OFF	65	60	84	7L	4	424	1R			
15:46:06.80	0	15	4	1			OFF	65	60	84	7L	4	424	1R			
15:46:06.87	0	15	4	1			OFF	65	60	84	7L	4	424	1R			
15:46:06.87	0	15	4	0			OFF	65	60	84	7L	4	424	1R			
15:46:06.87	0	15	4	0			OFF	65	60	84	7L	4	424	1R			
15:46:06.94	0	15	4	0			OFF	65	60	83	6L	4	416	1R			
15:46:06.94	0	15	4	0			OFF	65	60	83	6L	4	416	1R			
15:46:07.00	0	15	4	0			OFF	65	60	83	6L	4	408	1R			
15:46:07.00	0	15	4	0			OFF	65	60	83	6L	4	408	1R			
15:46:07.07	0	15	4	0			OFF	65	60	82	6L	4	400	1R			
15:46:07.07	0	15	4	0			OFF	65	60	82	6L	4	400	1R			
15:46:07.07	0	15	4	0			OFF	65	60	82	6L	4	400	1R			
15:46:07.13	0	15	4	1			OFF	65	60	82	6L	4	400	1R			
15:46:07.13	0	15	4	1			OFF	65	60	82	6L	4	400	1R			
15:46:07.20	0	15	4	1			OFF	65	60	81	6L	4	396	1R			
15:46:07.20	0	15	4	1			OFF	65	60	81	6L	4	396	1R			
15:46:07.26	0	15	4	1			OFF	65	60	81	6L	4	388	1R			
15:46:07.26	0	15	4	1			OFF	65	60	81	6L	4	388	1R			
15:46:07.33	0	15	4	1			OFF	65	60	80	6L	4	384	1R			
15:46:07.33	0	15	4	1			OFF	65	60	80	6L	4	384	1R			
15:46:07.39	0	15	4	1			OFF	65	60	80	6L	4	376	1R			
15:46:07.39	0	15	4	1			OFF	65	60	80	6L	4	376	1R			
15:46:07.46	0	15	4	1			OFF	65	60	80	6L	4	372	1R			
15:46:07.46	0	15	4	1			OFF	65	60	80	6L	4	372	1R			
15:46:07.53	0	15	4	1			OFF	65	60	79	6L	4	364	1R			
15:46:07.53	0	15	4	1			OFF	65	60	79	6L	4	364	1R			
15:46:07.59	0	15	4	1			OFF	65	60	74	6L	4	360	1R			
15:46:07.59	0	15	4	1			OFF	65	60	74	6L	4	360	1R			
15:46:07.66	0	15	4	1			OFF	65				4	352	1R			
15:46:07.72	0	15	4	1			OFF	65				4	348	1R			
15:46:07.79	0	15	4	1			OFF	65				4	340	1R			
15:46:07.85	0	15	4	1			OFF	65				4	336	1R			
15:46:07.85	0	15	4	1			OFF	65				4	336	1R			
15:46:07.92	1	15	4	1			OFF	65				3	328	1R			
15:46:07.98	1	15	4	1			OFF	65				3	324	1R			
15:46:08.05	1	15	4	1			OFF	65	3	368	3R	3	320	1R			
15:46:08.05	1	15	4	1			OFF	65	3	368	3R	3	320	1R			
15:46:08.12	1	15	4	1			OFF	65	3	364	4R	3	312	1R			
15:46:08.12	1	15	4	1			OFF	65	3	364	4R	3	312	1R			
15:46:08.18	1	15	4	1			OFF	65	3	356	4R	3	308	1R			

									OBJECTS								
									1			2			3		
TIME	*TONE ALRT	HD-WY	VL	STR	SIG	SID SNS	VEH BRK	SPD MPH	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT
15:46:08.18	1	15	4	1			OFF	65	3	356	4R	3	308	1R			
15:46:08.25	1	15	4	1			OFF	65	3	352	4R	3	300	1R			
15:46:08.25	1	15	4	1			OFF	65	3	352	4R	3	300	1R			
15:46:08.31	1	15	4	1			OFF	65	3	344	3R	3	296	1R			
15:46:08.31	1	15	4	1			OFF	65	3	344	3R	3	296	1R			
15:46:08.38	1	15	4	1			OFF	65	3	340	3R	3	237	0			
15:46:08.38	1	15	4	2			OFF	65	3	340	3R	3	237	0			
15:46:08.38	1	15	4	2			OFF	65	3	340	3R	3	237	0			
15:46:08.44	1	15	4	2			OFF	65	2	332	3R						
15:46:08.51	1	15	4	2			OFF	65	2	328	3R						
15:46:08.57	1	15	4	2			OFF	65	3	320	3R						
15:46:08.64	1	15	4	2			OFF	65	2	316	3R						
15:46:08.64	1	15	4	1			OFF	65	2	316	3R						
15:46:08.71	1	15	4	1			OFF	65	2	308	3R						
15:46:08.77	1	15	4	1			OFF	65	2	304	3R						
15:46:08.84	1	15	4	1			OFF	65	2	296	3R						
15:46:08.90	1	15	4	1			OFF	65	2	292	3R						
15:46:08.90	1	15	4	1			OFF	65	2	292	3R	3	236	1L			
15:46:08.97	1	15	4	1			OFF	65	3	284	3R	3	232	1L			
15:46:08.97	1	15	4	1			OFF	65	3	284	3R	3	232	2L			
15:46:08.97	1	15	4	1			OFF	65	3	284	3R	3	232	2L			
15:46:09.03	1	15	4	1			ON	65	3	280	3R	3	228	2L			
15:46:09.03	1	15	4	1			ON	65	3	280	3R	3	228	2L			
15:46:09.10	1	15	4	1			ON	65	3	272	3R	3	220	2L			
15:46:09.10	1	15	4	1			ON	65	3	272	3R	3	220	2L			
15:46:09.16	1	15	4	1			ON	65	3	264	3R	4	216	2L			
15:46:09.16	1	15	4	1			ON	65	3	264	3R	4	216	2L			
15:46:09.23	1	15	4	1			ON	65	3	260	3R	4	208	2L			
15:46:09.23	8	15	4	2			ON	64	3	260	3R	4	208	2L			
15:46:09.23	8	15	4	2			ON	64	3	260	3R	4	208	2L			
15:46:09.30	8	15	4	2			ON	64	2	252	2R	3	204	2L			
15:46:09.30	8	15	4	2			ON	64	2	252	2R	3	204	2L			
15:46:09.36	8	15	4	2			ON	64	2	248	2R	4	198	2L			
15:46:09.36	8	15	4	2			ON	64	2	248	2R	4	198	2L			
15:46:09.43	8	15	4	2			ON	64	2	188	2R	4	192	2L			
15:46:09.43	8	15	4	2			ON	64	2	188	2R	4	192	2L			
15:46:09.49	8	15	4	2			ON	64				5	188	2L			
15:46:09.49	8	15	4	6			ON	62				5	188	2L			
15:46:09.56	8	15	4	6			ON	62				4	182	2L			
15:46:09.62	8	15	4	6			ON	62				5	176	2L			
15:46:09.69	8	15	4	6			ON	62				5	172	2L			
15:46:09.75	8	15	4	6			ON	62				5	166	2L			
15:46:09.75	8	15	4	9L			ON	61				5	166	3L			
15:46:09.82	8	15	4	9L			ON	61				6	160	3L			
15:46:09.88	8	15	4	9L			ON	61				6	154	2L			
15:46:09.95	8	15	4	9L			ON	61				7	150	3L			
15:46:10.02	8	15	4	9L			ON	61				7	144	3L			
15:46:10.02	8	15	4	11L			ON	57				7	144	3L			
15:46:10.08	8	15	4	11L			ON	57				8	140	3L			

Driver ID: 12345 Vehicle ID: 1712
Event Date: 11-JAN-1999 Event Number: 1 V04.2B Page 4

									OBJECTS 1			OBJECTS 2			OBJECTS 3		
TIME	*TONE ALRT	HD-WY	VL	STR	SIG	SID SNS	VEH BRK	SPD MPH	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT
15:46:10.15	8	15	4	11L			ON	57				7	134	2L			
15:46:10.21	8	15	4	11L			ON	57				7	130	2L			
15:46:10.28	8	15	4	11L			ON	57				7	124	2L			
15:46:10.34	8	15	4	11L			ON	57				6	120	2L			
15:46:10.34	8	15	4	11L			ON	57				6	120	2L			
15:46:10.41	8	15	4	3			ON	53				7	116	2L			
15:46:10.47	8	15	4	3			ON	53				5	110	2L			
15:46:10.54	8	15	4	3			ON	53				6	106	1L			
15:46:10.61	8	15	4	3			ON	53				6	100	1L			
15:46:10.61	8	15	4	3			ON	53				6	100	1L			
15:46:10.67	8	15	4	3			ON	50				5	97	1L			
15:46:10.74	8	15	4	3			ON	50				5	92	1L			
15:46:10.80	8	15	4	3			ON	50				6	87	1L			
15:46:10.87	8	15	4	3			ON	50				5	83	1L			
15:46:10.87	8	15	4	3			ON	48				5	83	1L			
15:46:10.93	8	15	4	3			ON	48				6	79	1L			
15:46:11.00	8	15	4	3			ON	48				5	75	1L			
15:46:11.06	8	15	4	3			ON	48				6	70	1L			
15:46:11.13	8	15	4	3			ON	48				6	66	1L			
15:46:11.13	8	15	4	6			ON	46				6	66	0			
15:46:11.20	8	15	4	6			ON	46				6	62	0			
15:46:11.26	8	15	4	6			ON	46				6	58	0			
15:46:11.33	8	15	4	6			ON	46				6	54	0			
15:46:11.39	8	15	4	6			ON	46				6	50	0			
15:46:11.39	9	15	4	11L			ON	45				6	50	0			
15:46:11.46	9	15	4	11L			ON	45				6	46	0			
15:46:11.52	9	15	4	11L			ON	45				6	42	1R			
15:46:11.59	9	15	4	11L			ON	45				7	38	1R			
15:46:11.65	9	15	4	11L			ON	45				7	34	1R			
15:46:11.65	8	15	4	17L			ON	42				7	34	1R			
15:46:11.72	8	15	4	17L			ON	42				7	31	1R			
15:46:11.79	8	15	4	17L			ON	42				6	27	1R			
15:46:11.85	8	15	4	17L			ON	42				6	23	1R			
15:46:11.92	8	15	4	17L			ON	42				5	20	1R			
15:46:11.92	8	15	4	22L			ON	38				5	20	1R			
15:46:11.98	8	15	4	22L			ON	38				5	16	1R			
15:46:12.05	8	15	4	22L			ON	38				4	0	0			
15:46:12.18	8	15	4	22L			ON	38									
15:46:12.24	0	15	4	26L			ON	37	19	439	23R						
15:46:12.31	0	15	4	26L			ON	37	19	431	22R						
15:46:12.38	0	15	4	26L			ON	37	18	431	23R						
15:46:12.38	0	15	4	26L			ON	37	18	431	23R						
15:46:12.44	0	15	4	40L			ON	35	18	431	23R						
15:46:12.51	0	15	4	40L			ON	35	17	431	23R						
15:46:12.57	0	15	4	40L			ON	35	17	431	23R						
15:46:12.64	0	15	4	40L			ON	35	16	423	23R						
15:46:12.64	0	15	4	40L			ON	35	16	423	23R						
15:46:12.70	0	15	4	37L			ON	33	16	423	23R						
15:46:12.77	0	15	4	37L			ON	33	15	423	23R						

									OBJECTS 1			2			3		
TIME	*TONE ALRT	HD-WY	VL	STR	SIG	SID SNS	VEH BRK	SPD MPH	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT	SPD MPH	RNG FT	XR FT
15:46:12.83	0	15	4	37L			ON	33	15	423	23R						
15:46:12.90	0	15	4	37L			ON	33	14	415	22R						
15:46:12.90	0	15	4	37L			ON	33	14	415	22R						
15:46:12.97	0	15	4	33L			ON	31	14	415	23R						
15:46:13.03	0	15	4	33L			ON	31	13	397	22R						
15:46:13.16	0	15	4	33L			ON	31									
15:46:13.49	0	15	4	22L			ON	25									
15:46:13.69	0	15	4	8			ON	23									
15:46:13.69	0	15	4	8			ON	21									
15:46:13.69	0	15	4	8			ON	21									
15:46:13.69	0	15	4	8			ON	21									
15:46:13.76	0	15	4	8			ON	21									
15:46:13.76	0	15	4	8			ON	21									
15:46:13.76	0	15	4	8			ON	21									

Vehicle ID: 1712
All Targets
Event Date: 11-JAN-1999 15:46:00

Driver ID: 12345
Event Number: 1

S/W Version: 40736-103
A/R V04.2B
Timespan: 60 seconds

APPENDIX A

RECOMMENDED CUSTOMER

PROPERTY CONTROL FORM

Eaton VORAD Customer

PROPERTY CONTROL FORM

Company Name:_____ Address:_____ _____ Company Telephone:	Company Designated Representative: Name:_____ Title:_____ Telephone:_____
Property Description: ☐ Accident Data CPU ☐ Trip Segment Data Card ☐ Other Describe_____	Property Item Marking/Identification:

ACCIDENT or INCIDENT INFORMATION

Accident Date: Time:	Driver Name:
Accident Location:	Vehicle ID and Description:
Weather Conditions:	Number of Vehicles Involved:
Comments:	

PROPERTY HANDLING RECORD/LOG

CPU Removed From Vehicle By: _____ _____ (Printed name) (Signature) Company:_____ Title:_____	Date CPU Removed:_____ Time CPU Removed:_____ Vehicle Location When CPU Removed:

Person With CPU Custody Printed Name	Signature	Date	Time	Action Taken or Reason for Handling CPU

Appendix A

APPENDIX B

VORAD SAFETY SYSTEMS, INC

PROPERTY CONTROL FORM

VORAD Safety Systems

PROPERTY CONTROL FORM

Property Description: _____ _____ _____ _____	VORAD Assigned ID
Received From: _____ Address: _____	Date Received:
Property Received By: _____ _____ (Printed Name) (Signature)	Time Received:
Property Transmittal Method: ☐ FEDEX ☐ UPS ☐ U.S.Mail Other – describe:	Carrier ID Number:
Secured Storage Location:	Date/Time Secured:

VORAD INTERNAL HANDLING RECORD/LOG

Printed Name	Signature	Date	Time	Action/Reason	Property Disposition	Date	Time

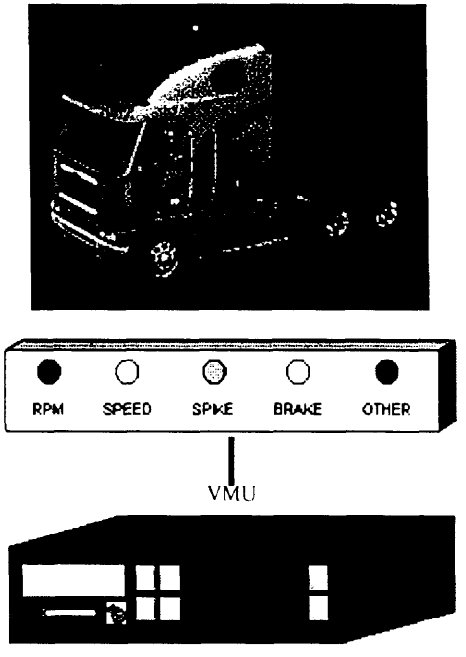
Note: Property shall be kept in secured storage when not in physical custody of authorized personnel.

FINAL PROPERTY DISPOSITION

Property sent to: Date/Time	Transmittal Method/Carrier: Carrier ID No.:
Property sent by: Name:	Signature:

Traxis System Components

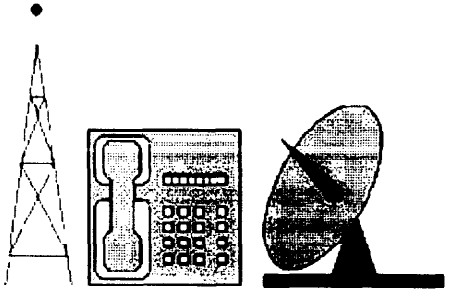
Vehicle and Sensors



Vehicle Monitoring Unit

The VMU is our basic on-board computer. It is connected to sensors that automatically collect vehicle/driver performance information. The VMU also has a key-pad and screen, providing the driver with an input and display terminal. It can interface with peripheral on-board hardware, including wireless communication transceivers and has an optional GPS receiver.

Wireless Options



TraxCard

The key to the flexibility of the Traxis System is the TraxCard. It is a compact, powerful data storage device. It stores the system data collected by the on-board system and holds many of the programmed commands that determine

Radio Cellular Satellite

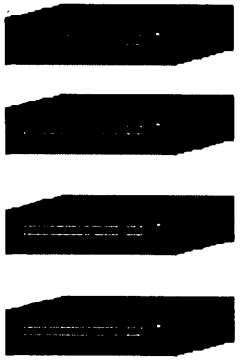
TraxCard

how the VMU functions. Changing the VMU function to suit new information management requirements is often as simple as loading different instructions on the card.

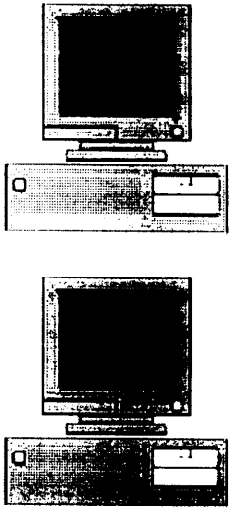
Clockout Station

A Clockout Station is the interface to the Traxis Management Information System. At the end of each trip, operators insert their cards in the reader station which automatically transfers data from the TraxCard to the Management System databases. New VMU operating instructions are then reloaded back onto the card for the next trip. Multiple clockout stations can operate locally or as part of a local or wide area network.

Clockout Stations



Management Terminals



Data Warehouse

Data from the clockout sites is retrieved, processed and stored in an open database structure - the Warehouse. This facility is used to generate management reports, and provide you with access to generate your own reports or applications. The central PC station where the warehouse resides also performs card management (sending clockout parameters or instructions to remote sites) and fleet inventory (maintaining driver, truck, trailer, and other fleet related files).

Customized Solutions/Applications

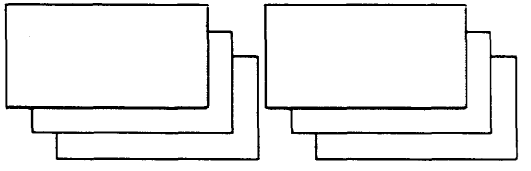
With our industry knowledge and systems expertise, we can provide customized solutions and applications. We analyze your needs, evaluate alternative approaches, design, and implement the most suitable solution. Our full range of consulting and development services are available to you.

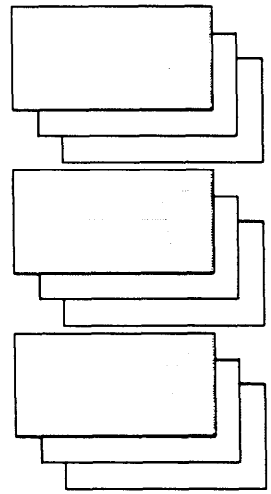
Corporate Systems

In some cases, you may have already implemented your applications on existing computer systems. Thus, our challenge is one of integration. Alternatively, using the Warehouse data dictionary, you can have direct access to our databases - for existing or new applications you want to tackle on your own.

Driver Reports

Clockout stations can be programmed to automatically print reports for operators when they download their TraxCards at the terminal location. These reports typically include Driver Summary Reports, TraxoGraphs, Driver Logs, Payroll, or other custom reports. This immediate feedback helps operators evaluate work activities, and comply with regulations.





Management Reports

Traxis offers a comprehensive reporting package for fleet management purposes. The Reporting System is very flexible and offers ample scope for customization. Users can configure data fields, report format, and also download information to other systems. Standard applications include activity monitoring, driver performance, productivity management, maintenance scheduling, fuel tax reporting, duty-log management, as well as positioning and mapping applications.

Traxis System Benefits

1 Improved Driver Performance and Motivation

The Traxis Fleet Management Information System helps improve driver performance. Drivers respond favourably to incentive programs based on an objective evaluation of their performance. Even the most experienced ones display remarkable improvements in their driving habits (speeding, braking, shifting, idling, etc.).

2 Better Equipment Utilization and Maintenance

The Traxis System provides a comprehensive database to track and manage your equipment utilization. The system helps you deploy your equipment more productively, and make informed equipment replacement and maintenance decisions. You can schedule your maintenence events according to actual use in distance, engine time, or any other variable.

3 Enhanced Service and Delivery Management

The Traxis System provides an excellent trail of mobile activity patterns, and helps improve schedule adherence with all the necessary back-up data customers require. As a result, you can focus on productivity management based on actual route activity data. and thereby increase dispatch efficiency, reduce delivery costs, and at the same time improve customer satisfaction.

4 Reduced Paperwork and Administration

The Traxis system facilitates data entry and helps reduce or even eliminate paperwork. For example, many of our customers use electronic trip sheets to record transactions such as pick-up, delivery, and fuel purchases and enter associated data such as waybill number or fuel quantity. The system also automates fuel tax calculations and reporting.

5 Effective Safety and Regulatory Compliance

The Traxis System can help improve regulatory compliance practices and prevent safety or work rule violations. Regulatory authorities enforce duty-log rules and practices with increasing stringency. The Traxis log management system facilitates easy storage of records and trouble free audits. At the same time, management tools like driver availability reports help schedule drivers within log rule allowances.

The end result is more efficient and productive fleet operation. With a rigorous implementation program, you can achieve substantial savings in labour, fuel, maintenance, the Traxis System, will payback within six to eighteen months.
